

We Claim :

1. A process for the preparation of water insoluble, bio-release iron-manganese fertilizer which comprises,
 - (a) heating phosphoric acid with a mixture of (i) source of iron oxide such as goethite and hematite, (ii) pyrolusite and (iii) one or more basic compound(s) selected from oxide(s) or carbonate(s) of magnesium, calcium, sodium and potassium,
 - (b) neutralisation followed by drying and pulverisation.
2. A process as claimed in Claim 1 wherein the iron oxide and pyrolusite are used in any of the molar ratios of Fe : Mn = 1 : 0 to 0 : 1 .
3. A process as claimed in Claims 1 and 2 wherein the iron oxide and pyrolusite are preferably used in the molar ratio of Fe : Mn = 1 : 0.51.
4. A process as claimed in Claim 1 wherein the basic compound is preferably magnesium oxide or carbonate and is used in the molar ratio of Fe : Mg = 1 : 0.6 to 1 : 1.75 but preferably in the ratio 1 : 1.15.
5. A process as claimed in Claim 1 wherein the basic compound is calcium oxide or carbonate and is used in the molar ratio of Fe : Ca = 1 : 0.6 to 1 : 1.75 but preferably is 1 : 1.15.

6. A process as claimed in Claim 1 wherein the basic compound is potassium oxide or carbonate and is used in the molar ratio of Fe : K = 1 : 1.2 to 1 : 3.5 but preferably is 1 : 2.3.
7. A process as claimed in Claim 1 wherein the basic compound is sodium oxide or carbonate and is used in the molar ratio of Fe : Na = 1 : 1.2 to 1 : 3.5 but preferably is 1 : 2.3.
8. A process as claimed in Claims 1 to 7 where phosphoric acid is used is equal to or greater than that required to convert all the cations in the reaction mixture to dihydrogen phosphates.
9. A process as claimed in Claims 1 to 8 where the components Fe, Mn, Mg or Ca and P are preferably used in the molar ratio of Fe : Mn : Mg or Ca : P = 1 : 0.51 : 1.15 : 7.34.
10. A process as claimed in Claims 1 to 8 where the components Fe, Mn, K or Na and P are preferably used in the molar ratio of Fe : Mn : K or Na : P = 1 : 0.51 : 2.3 : 7.34.
11. A process as claimed in Claim 1 wherein the reaction is carried out at any temperature of 160⁰C and above.
12. A process as claimed in Claim 1 wherein the reaction is preferably carried out in the temperature range of 200-250⁰C.

13. A process as claimed in Claim 1 to 12 wherein water formed during the initial reactions is removed by heating or vacuum.
14. A process as claimed in Claim 1 to 13 wherein the reaction is terminated on the partial polymerisation of the polyphosphate as herein exemplified.
15. A process as claimed in Claim 1 wherein the liquid product is neutralised with a base and dried at a temperature not exceeding 100⁰C, optimally at 60-80⁰C.
16. A process as claimed in Claim 1(b) wherein the base for neutralisation is selected from magnesia, magnesium carbonate, lime and ammonia and is preferably ammonia.
17. A process for the preparation of water insoluble iron-manganese fertilizers substantially as herein described with reference to the examples.